SET I:
True or False

T  F  1: For a multiple IV bolus regimen, if the dosing interval is the same, the shorter
the half-life the more pronounced the differences between peak and trough
concentrations.

T  F  2: For a multiple IV bolus regimen, the longer dosing interval, the longer it will
take to achieve steady state.

T  F  3: For a multiple IV bolus regimen, AUC at steady state within one dosing
interval increases with the increase in dose.

T  F  4: For a multiple IV bolus regimen, the accumulation degree is larger in patients
with higher clearance.

T  F  5: It takes more time to reach steady state for a drug with a higher degree of
accumulation. (Assuming loading dose is not given, and dosing interval is the
same.)
SET II:
A clinical study for drug X was conducted in 120 healthy volunteers. Drug X was given via IV bolus. The pharmacokinetics of Drug X can be described by linear one-compartment model. Volume of distribution of this drug is 13.3 L, and its half-life is 4 hr. If M.J was administrated this drug every 8hr (TID),

1. Calculate the accumulation factor at steady state.
2. Calculate the average concentration for a dose of 200mg.
3. Calculate the maximum and minimum plasma concentrations ($C_{\text{max}}$, $C_{\text{min}}$) in the body at steady state if dose of 40mg.

SET III:
For a multiple IV bolus regimen in a one-compartmental model, under following conditions,

a) Decrease clearance by two-fold
b) Increase volume of distribution by two-fold
c) Double each dose amount
d) Change dosing interval from twice a day (BID) to once a day (QD)

Discuss the change of the average steady-state concentration, the peak concentration, and the fluctuation

<table>
<thead>
<tr>
<th>scenarios</th>
<th>$C_{\text{avg,ss}}$</th>
<th>$C_{\text{max,ss}}$</th>
<th>$F$</th>
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</thead>
<tbody>
<tr>
<td>a) $\text{CL} \downarrow 2$ folds</td>
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<tr>
<td>b) $V_{d} \uparrow 2$ folds</td>
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<tr>
<td>c) $D \uparrow 2$ folds</td>
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<tr>
<td>d) $\left( \tau \text{ halved} \downarrow \right)$</td>
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